UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/420,912	10/20/1999	JON ALLEN FORD	CASE-1	3426

7590 10/20/2003		EXAMINER
AVAYA INC		SHAFFER, ERIC T
DAVID VOLEJNICEK , ESQ		
307 MIDDLETOWN- LINCROFT ROAD	ART UNIT	PAPER NUMBER
ROOM 1N- 391	3623	
LINCROFT, NJ 07738		

DATE MAILED: 10/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/420,912	FORD, JON ALLEN
	Examiner	Art Unit
	Eric T. Shaffer	3623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>08 August 2003</u> .

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24 and 27-59* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24 and 27-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

1.   This communication is in response to the amendments filed August 8, 2003.

Summary of Instant Office Action

2.   Applicant's arguments, filed August, 8, 2003, concerning claims 1 - 24 and 27 - 59 in the Office Action mailed June 18, 2003, have been considered and deemed unpersuasive.

3.   None of the pending claims have been cancelled by the applicant and the applicant has added no new claims. Claims 1 - 24 and 27 - 59 are pending and prosecuted in the response set out below. Previous office action erroneously claimed only claims 11-24 and 36-59 were pending. Said error has been corrected in the following office action.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 1 - 24 and 27 - 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walker et al. (US 5,963,911) in view of Bushey et al. (US 6,389,400).

As per claims 1 and 36, Walker et al. disclose a method of selecting a resource for a work item, and a computer-readable medium containing instructions which, when executed

in a computer, cause the computer to perform selection of a resource for a work item,

comprising:

determining available resources that possess skills needed by the work item (see column

1, lines 61-62, column 2, lines 8-12, and column 4, lines 8-23, there will be forecasts predicting

when the resources will become available, when the resources, or technicians, become available

they will be assigned work items, or jobs, only resources with the necessary skills will be

matched with the work item); and

for each of the determined resources, determining a business value of having the resource

service the work item, the business value being a measure of qualification of the resource for

servicing the work item based on skills of the resource and skill requirements of the work item

(see column 1, lines 65-67, through column 2, lines 1-12, and column 3, lines 1-16, the business

value is determined by finding the amount of time it would take the resource, or technician, to

complete the work item, or job, the business value is a measure of the qualification of the

resource and the work item based on skills and requirements).

Walker et al. did not explicitly disclose for each of the determined resources, determining

a value to the resource of servicing the work item, the value to the resource being a measure of

how the resource is spending time compared with other resources and goals to the individual

resource; and selecting a determined resource that has a best combined value of the business

value and the value to the resource, to serve the work item. However, Bushey et al. explicitly

teaches having system that matches the resource best suited to handle a work item or call from a

customer (see abstract). Bushey et al. discloses placing a high value on finding a resource that

has the skills and meets the needs of a customer (see column 2, lines 34-37). Bushey et al. also

teaches incorporating the goals of a resource by weighing attributes to create an agent model (see

column 4, lines 1-3). Bushey at al. then uses the agent's model and matches it with

a customer model to determine the higher match score Bushey et al. discloses selecting a

resource that has a best combined value of the business value and the value to the resource, to

serve the work item, or call as it is first determined if the best resource is available and then

continues down the list (see column 4, lines 47-67, though column 5, lines 1-25). Therefore, it

would have been obvious to one of ordinary skill in the art at the time of the invention to modify

the disclosure of Walker et al. to include creating a value to the resource of servicing the work

item in the same conventional manner as disclosed by Bushey et al. because this would allow

employees to use and develop their skills in their jobs which increases their employee

satisfaction which leads to satisfied customers, higher productivity, and more profit for the

company.

As per claim 28, Walker discloses an apparatus comprising a processor for selecting a

resource for a work item, comprising:

Means for determining available resources that possess skills needed by the work item

(see column 1, lines 61-62, column 2, lines 8-12, and column 4, lines 8-23, there will be

forecasts predicting when the resources will become available, when the resources, or

technicians, become available they will be assigned work items, or jobs, only resources with the

necessary skills will be matched with the work item); and Means for determining, for each of the

determined resources, a value to the resource of serving the work item, the business value being

a measure of qualification of the resource for servicing the work item based on skills of the

resource and skills of the resource and skill requirements of the work item (see column 1, lines

65-67, through

column 2, lines 1-12, and column 3, lines 1-16, the business value is determined by finding

the amount of time it would take the resource, or technician, to complete the work item, or

job, the business value is a measure of the qualification of the resource and the work item

based on skills and requirements).

Walker et al. did not explicitly disclose means for each of the determined resources, a

value to the resource of servicing the work item, the value to the resource being a measure of

how the resource is spending time compared with the other resources and goals of the individual

resource; and means for selecting a determined resource that has a best combined value of the

business value and the value to the resource, to serve the work item. However, Bushey et al.

explicitly teaches having system that matches the resource best suited to handle a work item or

call from a customer (see abstract). Bushey et al. discloses placing a high value on finding a

resource that has the skills and meets the needs of a customer (see column 2, lines 3437). Bushey

et al. also teaches incorporating the goals of a resource by weighing attributes to create an agent

model (see column 4, lines 1-3). Bushey at al. then uses the agent's model and matches it with a

customer model to determine the higher match score Bushey et al. discloses selecting a resource

that has a best combined value of the business value and the value to the resource, to serve the

work item, or call as it is first determined if the best resource is available and then continues

down the list (see column 4, lines 47-67, though column 5, lines 1-25). Therefore, it would have

been obvious to one of ordinary skill in the art at the time of the invention to modify the

disclosure of Walker et al. to include creating a value to the resource of servicing the

work item in the same conventional manner as disclosed by Bushey et al. because this would

allow employees to use and develop their skills in their jobs which increases their employee

satisfaction which leads to satisfied customers, higher productivity, and more profit for the

company.

As per claim 29, Walker discloses an apparatus for selecting a resource for a work item,

comprising:

Means for determining available resources that possess skills needed by the work item

(see column 1, lines 61-62, column 2, lines 8-12, and column 4, lines 8-23, there will be

forecasts predicting when the resources will become available, when the resources, or

technicians, become available they will be assigned work items, or jobs, only resources with the

necessary skills will be matched with the work item); and Means for determining, for each of the

determined resources, a business value comprising a sum across all skills of a product of a skill

level of the resource in the skill and a skill weight of the work item for the skill (see column 7,

lines 11-24, every resource, or technician, contains a skill level and is weighted according to this

skill level when combined with a work item, or job);

Walker et al. does not explicitly disclose a means for determining, for each of the

determined resources, a resource treatment value, the resource treatment value being a measure

of how the resource is spending time compared with the other resources and goals of the

individual resource, the resource treatment value comprising a sum across all resource treatments

of a product of a value of the resource for the resource

treatment; and a weight of the work item for the resource treatment; and a means for selecting a

determined resource that has a best combined score of its business value and its resource

treatment value, to serve the work item. However, Bushey et al. explicitly teaches having system that matches the resource best suited to handle a work item or call from a customer (see abstract). Bushey et al. discloses placing a high value on finding a resource that has the skills and meets the needs of a customer (see column 2, lines 34-37). Bushey et al. also teaches incorporating the goals of a resource by weighing attributes to create an agent model (see column 4, lines 1-3). Bushey at al. then uses the agent's model and matches it with a customer model to determine the higher match score Bushey et al. discloses selecting a resource that has a best combined value of the business value and the value to the resource, to serve the work item, or call as it is first determined if the best resource is available and then continues down the list (see column 4, lines 47-67, though column 5, lines 1-25). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Walker et al. to include creating a value to the resource of servicing the work item in the same conventional manner as disclosed by Bushey et al. because this would allow employees to use and develop their skills in their jobs which increases their employee satisfaction which leads to satisfied customers, higher productivity, and more profit for the company.

As per claim 32, Walker discloses an arrangement for selecting a resource for a work item, comprising:

An effector of determining available resources that possess skills needed by the work item (see column 1, lines 61-62, column 2, lines 8-12, and column 4, lines 8-23, there will be forecasts predicting when the resources will become available, when the resources, or technicians, become available they will be assigned work items, or jobs, only resources with the necessary skills will be matched with the work item); and

An effector of determining, for each of the determined resources, a business value to the

resource of serving the work item, the value to the resource being a measure of how the resource

is spending time compared with other resources and goals of the individual resource (see column

1, lines 65-67, through column 2, lines 112, and column 3, lines 1-16, the business value is

determined by finding the amount of time it would take the resource, or technician, to complete

the work item, or job, the business value is a measure of the qualification of the resource and the

work item based on skills and requirements).

Walker et al. did not explicitly disclose an effector of determining, for each of the

determined resources, an effector of determining, a value to the resource of servicing the work

item, the value to the resource being a measure of how the resource is

spending time compared with the other resources and goals of the individual resource; and an

effector of selecting a determined resource that has a best combined value of the business value

and the value to the resource, to serve the work item. However, Bushey et al. explicitly teaches

having system that matches the resource best suited to handle a work item or call from a

customer (see abstract). Bushey et al. discloses placing a high value on finding a resource that

has the skills and meets the needs of a customer (see column 2, lines 34-37). Bushey et al. also

teaches incorporating the goals of a resource by weighing attributes to create an agent model (see

column 4, lines 1-3). Bushey at al. then uses the agent's model and matches it with a customer

model to determine the higher match score Bushey et al. discloses selecting a resource that has a

best combined value of the business value and the value to the resource, to serve the work item,

or call as it is first determined if the best resource is available and then continues down the list

(see column 4, lines 47-67, though column 5, lines 1-25). Therefore, it would have been obvious

to one of ordinary skill in the art at the time of the invention to modify the disclosure of Walker

et al. to include creating a value to the resource of servicing the work item in the same

conventional manner as disclosed by Bushey et al. because this would allow employees to use

and develop their skills in their jobs which increases their employee satisfaction which leads to

satisfied customers, higher productivity, and more profit for the company.

As per claim 33, Walker et al. disclose an arrangement for selecting a resource for a

work item, comprising:

An effector of determining available resources that possess skills needed by the work

item (see column 1, lines 61-62, column 2, lines 8-12, and column 4, lines 8-23, there will be

forecasts predicting when the resources will become available, when the resources, or

technicians, become available they will be assigned work items, or jobs, only resources with the

necessary skills will be matched with the work item);

An effector of determining, for each of the determined resources, a business value

comprising a sum across all skills of a product of a skill level of the resource in the skill and a

skill weight of the work item for the skill (see column 7, lines 11-24, every resource, or

technician, contains a skill level and is weighted according to this skill level when combined

with a work item, or job);

Walker et al. does not explicitly disclose an effector of determining, for each of the

determined resources, a resource treatment value, the resource treatment value being a measure

of how the resource is spending time compared with other resources and goals of the individual

resource, the treatment value comprising a sum across all resource treatments of a product of a

value of the resource for the resource treatment and a weight of the work item for the resource

treatment; and an effector of selecting a determined resource that has a best combined score of its

business value and its resource treatment value, to serve the work item. However, Bushey et al.

explicitly teaches having system that matches the resource best suited to handle a work item or

call from a customer (see abstract). Bushey et al. discloses placing a high value on finding a

resource that has the skills and meets the needs of a customer (see column 2, lines 34-37).

Bushey et al. also teaches incorporating the goals of a resource by weighing attributes to create

an agent model (see column 4, lines 1-3). Bushey at al. then uses the agent's model and matches

it with a customer model to determine the higher match score Bushey et al. discloses selecting a

resource that has a best combined value of the business value and the value to the resource, to

serve the work item, or call as it is first determined if the best resource is available and then

continues down the list (see column 4, lines 47-67, though column 5, lines 1-25). Therefore, it

would have been obvious to one of ordinary skill in the art at the time of the invention to modify

the disclosure of Walker et al. to include creating a value to the resource of servicing the work

item in the same conventional manner as disclosed by Bushey et al. because this would allow

employees to use and develop their skills in their jobs which increases their employee

satisfaction which leads to satisfied customers, higher productivity, and more profit for the

company.

As per claims 2, and 37, Walker et al. disclose all the limitations of claims 1, and 36

wherein determining a business value comprises:

determining the business value weighted by a business value weight corresponding to the

work item (see column 7, lines 18-24, a weight is considered when determining the value for the

work item).

Walker et al. does not explicitly disclose determining a value to the resource comprises

determining the value to the resource weighted by a resource value weight corresponding to the

work item and selecting comprises selecting a determined resource that has a best combined

value of the weighted business value and the weighted value to the resource. However, Bushey et

al. teaches allowing employees to preference their assignments through the use of weights in

creating the agent model (see column 4, lines 1-3). It would have been obvious to one of

ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to

include creating a value to the resource weighted by a resource value weight corresponding to

the work item, as disclosed by Bushey et al., because this would allow employees to have

weighted preferences in the jobs they work increasing their employee satisfaction. By creating a

value that comprises selecting a determined resource that has a best combined value of the

weighted business value and the weighted value to the resource, the company many increase

profit for the company through higher employee and customer satisfaction.

As per claims 3 and 38, Walker et al. disclose all the limitations of the method of claims

2 and 37 wherein: determining a business value comprises determining a weighted business

value as a product of

(a) the business value weight corresponding to the work item (see column 7, lines

11-24, the weight corresponds to the work item); and

(b) a sum of products of a level of each said needed skill of the resource and a weight

of said needed skill of the work item (see column 7, lines 11-24, a cost will be weighted for a

work item in which the resource needs a particular skill).

Walker et al. does disclose creating a weight corresponding to a work item (see column 7, lines 11-24). However, Walker et al. does not explicitly teach determining a value to the resource comprises determining a weighted resource treatment value as a products of (c) a resource treatment weight corresponding to the work item and (d) a sum of products of each treatment of the resource and a weight of the treatment of the resource. Bushey et al. teaches allowing employees to preference attributes using weights to create the agent model (see column 4, lines 1-3). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to create a weighted value for the technicians as a product of the weighted technician's preferences and a sum of products of each treatment of the resource and a weight of the treatment of the resource, as taught by Bushey et al., since this would allow employees to have weighted preferences in the jobs they work increasing their employee satisfaction. By creating weighted resource treatment value, the company many increase productivity and profit for the company.

As per claims 4, and 39, Walker et al. disclose all the limitations of claims 3, and 38. Walker et al. does disclose scaling business values (see column 7, lines 11-24, the weights are used to scale values). Walker et al. does not explicitly disclose the sum of the products being scaled. Bushey et al. teaches allowing employees to preference attributes using weights to create the agent model (see column 4, lines 1-3). The weights created by Bushey et al. are scalable. Bushey et al. also teaches using the agent model and the customer model to determine an optimal match (see column 4, lines 10-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to scale the sum of the products, as taught by Bushey et al., since this would allow one to incorporate both the

business value of having the resource service the work item and the value to the resource of

servicing the work item. By incorporating both values in a scaled sum, both the company's

profits and the technician's preferences can be optimized.

As per claims 5 and 40, Walker et al. disclose all the limitation of claims 4 and 39

wherein: selecting comprises selecting the determined resource that has a highest weighted

business value (see column 2, lines 8-12, a combination of weighted business values is taught.

Walker et al. uses the lowest sum combination rather than the largest sum to find the best

combination).

Walker does not explicitly disclose selecting the determined resource that has a highest

sum of the weighted business value and the weighted resource treatment value. However,

Bushey et al. teaches creating an agent model using weights and matching that model with the

customer model that has the highest match score (see column 4, lines 1-3). It would have been

obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure by

Walker et al. to score the work items and resources, as taught by Bushey et al., since it allows

them to be matched based on an optimal pairing of high priority work items and high employee

preferences.

As per claims 6 and 41, Walker et al. disclose all the limitations of claims 3 and 38

wherein: the resource treatments of a resource comprise a time since the resource became

available and a time that the resource has not spent serving work items (see column 1, lines 61-

62, the time that the resource is available is forecasted).

As per claims 7 and 42, Walker et al. disclose all the limitations of the method of claims

6 and 41, wherein the treatments of the resource further comprise a measure of an effect that

serving of the work item would have on a goal of the resource (see column 2, lines 8-12, the resource and the work item with the smallest cost combination are matched, by keeping a small cost combination, the resource can earn a higher profit from the work item).

As per claims 8 and 43, Walker et al. disclose all the limitations of claims 7 and 42 wherein the measure of the effect comprises a difference between (a) a distance of an actual allocation of worktime of the resource among skills from a goal allocation of the work time of the resource among the skills and (b) a distance of an estimated allocation of the worktime a of the resource among the skills if the resource serves the work item from the goal allocation (see figure 16, and column 7, lines 35-59, the time that the resource completes the work item is predicted and displayed on the matrix; when the resource states that the work item is completed on time, early or late, the matrix changes and the values are recalculated to create low cost matches of the highest priority work items).

As per claims 9 and 44, Walker et al. discloses a method of selecting a resource for a work item, a computer-readable medium containing instructions which, when executed in a computer, cause the computer to perform selection of a resource for a work item, comprising:

determining available resources that possess skills needed by the work item (see column 4, lines 8-12, the work item, or job, may require a resource to have a particular skill); and

for each of the determined resources, determining a business value comprising a sum across all skills of a product of a skill level of the resource in the skill and a skill weight of the work item for the skill (see column 7, lines 11-24, every resource, or technician, contains a skill level and is weighted according to this skill level when combined with a work item, or job).

Walker et al. does not explicitly disclose for each of the determined resources, determining a resource treatment value, the resource treatment value being a measure of how the resource is spending time compared with other resources and goals of the individual resource, the resource treatment value comprising a sum across all resource treatments of a product of a value of the resource for the resource treatment and a weight of the work item for the resource treatment; and selecting a determined resource that has a best combined score of its business value and its resource treatment value, to serve the work item. However, Bushey et al. discloses measuring how a resource is spending time compared with other resources and that resource's goals by creating an agent model (by weighting attributes) and comparing the customer's model with the agents' models (see column 4, lines 1-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to create a resource treatment value, as taught by Bushey et al., since it allows a resource, an agent or technician, to have a value in creating an optimal pairing of work items, or customers, and high employee preferences.

As per claims 10 and 45, Walker et al. disclose all the limitations of claims 9 and 44, wherein the resource treatments of a resource comprise a time since the resource became available, a time that the resource has spent not serving work items, and a measure of an effect that serving the work item would have on a goal of the resource (see column 1, lines 61-62, the time that the resource is available is forecasted and column 14, lines 20-24, the resource that has completed a work item and has no new tasks assigned a new task by the method shown in figure 5, the new allocation would be based on the values calculated using the particular resource and the priority of the available work items to determine the best combination).

As per claims 11 and 46, Walker et al. discloses all the limitations of claims 9 and 44 wherein:

determining a business value comprises determining a scaled business value comprising the business value scaled by a first scaling factor that is common to all of the determined resources (see figure 12, and column 7, lines 11-24, the weights for probabilities are applied to all the resources having particular skills or other time involved in carrying out a work item);

Walker et al. does disclose scaling values using probabilities (see column 6, lines 64-67 through column 7, lines 1-24). However, Walker et al. does not explicitly disclose determining a resource treatment value that comprises for each resource treatment, determining a scaled value of the resource comprising the value of the resource for that resource treatment scaled by a scaling factor that is common for that resource treatment to all of the determined resources, and determining a scaled resource treatment value comprising a sum, scaled by a second scaling factor that is common to all of the determined resources, across all resource treatments of a product of the scaled value of the resource for the resource treatment and a weight of the work item for the resource treatment.

Bushey et al. teaches allowing employees to preference attributes using weights to create the agent model (see column 4, lines 1-3). Bushey et al.'s weighted models could be scaled. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to include creating a scaled resource treatment value as it allows a resource, agent, or technician, to have a value in creating an optimal pairing of work items' or customers' preferences and a resource or employee's

preferences. One would be motivated to scale the resource value as scaling a value allows it increases the accuracy of the comparison.

Walker et al. also does not disclose selecting a determined resource that has a best sum of its scaled business value and scaled resource treatment value to serve the work item. However, Bushey et al. discloses creating a resource treatment value by allowing agents to weight attributes for the agent model and matching the agent model to the customer model and create a highest match score (see column 4, lines 1-33). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to include creating a best sum of its scaled business value and scaled resource treatment value, as taught by Bushey et al., as it optimizes both the customer's satisfaction and the agent or technician's preferences.

As per claims 12 and 47, Walker et al. disclose all the limitations of claims 11 and 46 wherein: each scaling factor comprises a fraction having in its denominator a maximum value of the value to which said scaling factor applies of any of the resources (see column 7, lines 11-24, the scaling factor is a probability, therefore, its value can only be a number between zero and one).

As per claim 13, Walker et al. disclose a method of selecting a work item for a resource, comprising:

determining available work items that need skills possessed by the resource (see column 1, lines 61-62, column 2, lines 8-12, and column 4, lines 8-23, there will be forecasts predicting when the resources will become available, when the resources, or technicians, become available

they will be assigned work items, or jobs; only resources with the necessary skills will be

matched with the work item);

for each of the determined work items, determining a business value of having the

resource service the work item the business value being a measure of qualification of the

resource for servicing of the work item based on skills of the resource and skill requirements of

the work item (see column 1, lines 65-67, through column 2, lines 1-12, and column 3, lines 1-

16, the business value is determined by finding the amount of time it would take the resource, or

technician, to complete the work item, or job, the business value is a measure of the qualification

of the resource and the work item based on skills and requirements).

Walker et al. does not explicitly disclose determining a value to the work item of being

serviced by the resource, the value to the work item being a measure of how the work item is

treated compared to other work items and treatment goals of the individual work item; and

selecting a determined work item that has a best-combined value of the business value and the

value to the work item to be served by the resource. However, Bushey et al. teaches creating a

model of the customer based on their preferences, skills, and other attributes (see column 3, lines

14-67). Bushey et al. also teaches selecting a determined work item, or customer, that has a best-

combined value of the business value and the value to the work item to be served by the resource

as the highest match score between the agent and the resource is selected (see column 4, lines 1-

33). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the

invention modify the disclosure by Walker et al. to determine the value of the work item and

select the best combined business and work item value to the job, as taught by Bushey et al.,

since this method selects the most skilled resource to work with the most compatible customer thus improving both customer and employee satisfaction.

As per claim 14, Walker et al. disclose all the limitations of the method of claim 13 wherein: determining business value comprises determining the business value weighted by a business value weight corresponding to the work item (see column 7, lines 18-24, a weight is considered when determining the value for the work item). Walker et al. does disclose weighted values (see column 7, lines 35-59). However, Walker et al. does not explicitly disclose determining a value to the work item comprises determining the value to the work item weighted by a work item value weight corresponding to the work item; and selecting comprises selecting a determined work item that has a best combined value of the weighted business value and the weighted value to the work item. Bushey et al. discloses using customer attributes with weights to create the customer model (see column 3, lines 14-67). This customer model is then used to create the best-combined match for the resource, agent, and work item, customer. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to include weighting a work item as weighting a value allows it to be accurately compared with other values. It would also be obvious for one to select the best combined business and work item value as this method selects the most skilled resource to work with the most compatible customer thus improving both customer and employee satisfaction.

As per claim 15, Walker et al. disclose all the limitations of the method of claim 14 wherein: determining a business value comprises determining a weighted business value as a product of (a) the business value weight corresponding to the work item (see column 7, lines 11-24, the weight corresponds to the work item);

(b) a sum of products of a level of each said needed skill of the resource and a weight of said needed skill of the work item (see column 7, lines 11-24, a cost will be weighted for a work item in which the resource needs a particular skill).

Walker et al. does not explicitly teach determining a value to the work item comprises determining a weighted work item treatment value as a product of (c) a work item treatment weight corresponding to the work item; and (d) a sum of products of each treatment of the work item and a weight of the treatment of the a work item. However, Bushey et al. does teach the use of attributes and weights in creating the customer model (see column 2, lines 56-59). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to weight a work item and a sum of products of each treatment of the work item as weighting a value allows the value to be accurately compared to other values so a best match can be found.

As per claim 16, Walker et al. discloses all the limitations of the method of claim 15. Walker et al. does not explicitly disclose wherein the sums of products are scaled sums, and the treatments are scaled treatments. However, Bushey et al. discloses weighting the different customers attributes to create the model and using the model scores to create the best match (see column 3, lines 3, lines 14-65, through column 4, lines 1-29). Bushey et al. can also scale the scores. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to scale the sums of the products and the treatments as this selects the most skilled resource to be paired with the optimal work item or customer.

As per claim 17, Walker et al. disclose all the limitations of the method of claim 16. Walker does not explicitly disclose selecting the determined work item that has a highest sum of

the weighted business value and the weighted work item treatment value. Bushey et al. discloses

that the highest match score between the customer and the agent (see column 4, lines 7-30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the

invention to select the highest sum of the weighted business and work item values as this method

selects the most skilled resource, agent, to work with the most optimal work item or customer.

As per claim 18, Walker et al. disclose all the limitations of the method of claim 15

wherein the work item treatments of a work item comprise a time that the work item has been

waiting for service and an estimated time that the work item will have to wait for service (see

column 3, lines 53-65, and column 4, lines 40-41, a time is determined when the work item

should be performed).

As per claim 19, Walker et al. disclose all the limitations of the method of claim 18

wherein the treatments of a work item further comprise a time by which the work item has

exceeded its target wait time (see column 6, lines 53-63, the cost function for each work item

indicates if the target wait time or agreed upon time has been exceeded).

As per claim 20, Walker et al. discloses all the limitations of the method of claim 18

wherein the estimated wait time that the work item will have to wait for service comprises a

product of (a) a ratio of a total number of work items waiting for service and an average number

of work items waiting for service and (b) a sum of average wait times of individual said needed

skills each weighted by a ratio of the weight of said individual skill and a sum of the weights of

the needed skills. (see figure 16, and column 6, lines 53-63 and column 7, lines 11-24, and 35-

59, the time is estimated for a work item and weighted, it is predicted and displayed on the

matrix and assigned to a resource who has the skills needed to complete the work item, a ratio

and the average wait would be easily determined from the matrix as priority is assigned to every

received work item).

As per claim 21, Walker et al. discloses a method of selecting a work item for a resource,

comprising: determining available work items that need skills possessed by the resource (see

column 4, lines 8-12, the work item, or job, may require a resource, or technician, to have a

particular skill);

for each of the determined work items, determining a business value comprising a sum

across all skills of a product of a skill level of the resource in the skill and a skill weight of the

work item for the skill (see column 7, lines 11-24, every resource contains a skill level and is

weighted according to this skill level when combined with a work item. Walker et al. does not

explicitly disclose for each of the determined work items, determining a work item treatment

value, the work item treatment value being a measure of how the work item is treated compared

to other work items and treatment goals of the individual work item, the work item treatment

value, comprising a sum across all work item treatments of a product of the value of the work

item for the work item treatment and a weight of the a work item forth a work item treatment;

and selecting a determined work item that has a best combined score of its business value

and work item treatment value, to be served by the resource. However, Bushey et al. discloses

each of the customers and creating a weighted attribute model for each customer (see column 3,

lines 14-67). Bushey et al. also discloses comparing the customer model with the agent model to

determine the highest match score (see column 4, lines 7-9). If the customer cannot have the

highest score matched agent, after a predetermined period of time the second best matching

agent answers the call 9see column 4, lines 20-29). Therefore, it would have been obvious to one

of ordinary skill in the art at the time of the invention modify the disclosure by Walker et al. to

determine a customer, or work item, treatment value comprising a sum across all work item

treatments and select a determined work item that has a best combined score to be served by the

agent, or resource, as this allows the most skilled resource, or agent, to be matched with the most

compatible customer or work item thus improving both customer and employee satisfaction.

As per claim 22, Walker et al. disclose all the limitations of the method of claim 21

wherein: the work item treatments of a work item comprise a time that the work item has spent

waiting to be serviced, an estimated time that the item will spend waiting to

be serviced, and a time by which the work item has exceeded its target waiting time (see column

16, lines 56-67, through column 17, lines 1-5, the work items are divided into categories of

priority, the time dependent cost function is found for every work item which calculates the

waiting time).

As per claim 23, Walker et al. disclose all the claims of the method of claim 21 wherein:

determining a business value comprises determining a scaled business value comprising the

business value scaled by a first scaling factor that is common to all of the determined work items

(see figure 12, and column 7, lines 11-24, the weights for probabilities are applied to all the work

items needing a particular set of skills). Walker et al. discloses summing and scaling values

(column 7, lines 11-24). However, Walker et al. does not explicitly disclose determining a scaled

value of the work item comprising the value of the work item treatment scaled by a scaling factor

that is common for that work item treatment to all of the determined work items; and

determining a scaled work item treatment value comprising a sum, scaled by a second scaling

factor that is common for all of the determined work items, across all work item treatments of a

product of the scaled value of the work item treatment and a weight of the work item for the

work item treatment. However, Bushey et al. discloses creating a customer model using customer

attributes, weights, and other information (see column 3, lines 14-65). Bushey et al. models

could be scaled. Bushey et al.'s customer model is compared to agent models to determine the

highest match score (see column 4, lines 7-9). Therefore, it would have been obvious to one of

ordinary skill in the art at the time of the invention to determine a scaled work item treatment

value as this allows the different scaled values to be accurately compared.

Walker et al. also does not explicitly disclose selecting a determined work item that

has a best sum of its scaled business value and its scaled work item treatment value, to be is

served by the resource. Bushey et al. discloses creating a highest matched score between the

resource's or agent's model and the customer's or work item's model. Therefore, it would have

been obvious to one of ordinary skill in the art at the time of the invention to modify the

disclosure by Walker et al. to include selecting a determined work item that has a best sum

value as this allows the most skilled resource to work to be matched with the most compatible

customer or work item thus improving both customer and employee satisfaction.

As per claim 24, Walker et al. disclose all the limitations of the method of claim 23

wherein: each scaling factor comprises a fraction having in its denominator a maximum value of

the a value to which said scaling factor applies of any of the work items (see column 7, lines 11-

24, the scaling factor is a probability, therefore, its value can only be a number between zero and

one).

As per claim 27, Walker et al. disclose an apparatus comprising a processor that executes instructions to effect the method of one of the claims 1-24 (see column 5, lines 49-57, the apparatus performs the methods listed in claims 1-24).

As per claim 30, Walker et al. disclose an apparatus for selecting a work item for a resource, comprising:

Means for determining available work items that need skills possessed by the resource (see column 1, lines 63-67, and column 4, lines 8-12, the work item, or job, may require a resource, or technician, to have a particular skill);

Means for determining, for each of the determined work items, a business value of having the resource service the work item, the business value being a measure of qualification of the resource for servicing the work item based on skills of the resource and skills of the resource and skill requirements of the work item (see column 1, lines 65-67, through column 2, lines 1-12, and column 3, lines 1-16, the business value is determined by finding the amount of time it would take the resource, or technician, to complete the work item, or job, the business value is a measure of the qualification of the resource and the work item based on skills and requirements).

Walker et al. does not explicitly disclose a means for determining a value to the work item of being serviced by the resource, the value to the work item being a measure of how the work item is treated compared to other work items and treatment goals of the individual work item, the work item treatment value comprising a sum across all work item treatments of a product of the value of the work item for the work item treatment and a weight of the work items for the work item treatment; and a means for selecting a determined work item that has a best-

combined value of the business value and the value to the work item to be served by the

resource.

However, Bushey et al. discloses creating a weighted attribute model for each customer

(see column 3, lines 14-67). Bushey et al. also discloses comparing the customer model with the

agent model to determine the highest match score (see column 4, lines 7-9). If the customer

cannot have the highest score matched agent, after a predetermined period of time the second

best matching agent answers the call (see column 4, lines 20-29). Therefore, it would have been

obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure by

Walker et al. to include determining a customer, or work item, treatment value comprising a sum

across all work item treatments and select a determined work item that has a best combined score

to be served by the agent, or resource, as this allows the most skilled resource, or agent, to be

matched with the most compatible customer or work item thus improving both customer and

employee satisfaction.

As per claim 31, Walker et al. discloses an apparatus for selecting a work item for a

resource comprising:

Means for determining available work items that need skills possessed by the

resource (see column 1, lines 63-67, and column 4, lines 8-12, the work item, or job, may

require a resource, or technician, to have a particular skill);and

Means for determining, for each of the determined work items, determining a business

value comprising a sum across all skills of a product of a skill level of the resource in the skill

and a skill weight of the work item for the skill (see column 7, lines 11-24, every resource

contains a skill level and is weighted according to this skill level when combined with a work item.

Walker et al. does not explicitly disclose a means for determining, for each of the determined work items, determining a work item treatment value, the work item treatment value being a measure of how the work item is treated compared to other work items and treatment goals of the individual work item, the work item treatment value comprising a sum across all work item treatments of a product of the value of the work item for the work item treatment and a weight of the a work item forth a work item treatment; and a means for selecting a determined work item that has a best combined score of its business value and work item treatment value, to be served by the resource. However, Bushey et al. discloses creating a weighted attribute model for each customer (see column 3, lines 14-67). Bushey et al. also discloses comparing the customer model with the agent model to determine the highest match score (see column 4, lines 7-9). If the customer cannot have the highest score matched agent, after a predetermined period of time the second best matching agent answers the call (see column 4, lines 20-29). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to determine a customer, or work item, treatment value comprising a sum across all work item treatments and select a determined work item that has a best combined score to be served by the agent, or resource, as this allows the most skilled resource, or agent, to be matched with the most compatible customer or work item thus improving both customer and employee satisfaction.

As per claim 34, Walker et al. disclose an arrangement for selecting a resource for a work item, comprising:

An effector of determining available work items that need skills possessed by the resource (see column 1, lines 63-67, and column 4, lines 8-12, the work item, or job, may require a resource, or technician, to have a particular skill);

An effector of determining, for each of the determined work items, a business value of having the resource service the work item, the business value being a measure of qualification of the resource for servicing the work item based on skills of the resource and skills of the resource and skill requirements of the work item (see column 1, lines 65-67, through column 2, lines 1-12, and column 3, lines 1-16, the business value is determined by finding the amount of time it would take the resource, or technician, to complete the work item, or job, the business value is a measure of the qualification of the resource and the work item based on skills and requirements).

Walker et al. does not explicitly disclose an effector of determining a value to the work item of being serviced by the resource, the value to the work item being a measure of how the work item is treated compared to other work items and treatment goals of the individual work item, the work item treatment value; and an effector of selecting a determined work item that has a best-combined value of the business value and the value to the work item to be served by the resource. However, Bushey et al. discloses creating a weighted attribute model for each customer (see column 3, lines 14-67). Bushey et al. also discloses comparing the customer model with the agent model to determine the highest match score (see column 4, lines 7-9). If the customer cannot have the highest score matched agent, after a predetermined period of time the second best matching agent answers the call (see column 4, lines 20-29). Therefore, it would

have been obvious to one of ordinary skill in the art at the time of the invention to modify the

disclosure by Walker et al. to determine a customer, or work item, treatment value comprising a

sum across all work item treatments and select a determined work item that has a best combined

score to be served by the agent, or resource, as this allows the most skilled resource, or agent, to

be matched with the most compatible customer or work item thus improving both customer and

employee satisfaction.

As per claim 35, Walker et al. disclose an arrangement for selecting a resource for a

work item, comprising:

An effector of determining available work items that need skills possessed by the

resource (see column 1, lines 63-67, and column 4, lines 8-12, the work item, or job, may require

a resource, or technician, to have a particular skill);

An effector of determining, for each of the determined work items, a business value

comprising a sum across all skills of a product of a skill level of the resource in the skill and a

skill weight of the work item for the skill (see column 7, lines 11-24, every resource contains a

skill level and is weighted according to this skill level when combined with a work item.

Walker et al. does not explicitly disclose an effector of determining, for each of the

determined work items, a work item treatment value, the work item treatment value being a

measure of how the work item is treated compared to other work items and treatment goals of

the individual work item, the work item treatment value comprising a sum across all work

item treatments of a product of the value of the work item for the

work item treatment and a weight of the a work item forth a work item treatment; and an effector

of selecting a determined work item that has a best combined score of its business value and

work item treatment value, to be served by the resource.

However, Bushey et al. discloses creating a weighted attribute model for each customer

(see column 3, lines 14-67). Bushey et al. also discloses comparing the customer model with the

agent model to determine the highest match score (see column 4, lines 7-9). If the customer

cannot have the highest score matched agent, after a predetermined period of time the second

best matching agent answers the call (see column 4, lines 20-29). Therefore, it would have been

obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure by

Walker et al. to determine a customer, or work item, treatment value comprising a sum across all

work item treatments and select a determined work item that has a best combined score to be

served by the agent, or resource, as this allows the most skilled resource, or agent, to be matched

with the most compatible customer or work item thus improving both customer and employee

satisfaction.

As per claim 48, Walker discloses a computer-readable medium containing

instructions which, when executed in a computer, cause the computer to perform selection of

a work item for a resource, comprising:

Determining available work items that need skills possessed by the resource (see column

1, lines 63-67, and column 4, lines 8-12, the work item, or job, may require a resource, or

technician, to have a particular skill);

For each of the determined work items, determining a determining a business value of

having the resource service the work item, the business value being a measure of qualification of

the resource for servicing the work item based on skills of the

resource and skills of the resource and skill requirements of the work item (see column 1, lines

65-67, through column 2, lines 1-12, and column 3, lines 1-16, the business value is determined

by finding the amount of time it would take the resource, or technician, to complete the work

item, or job).

Walker et al. did not explicitly disclose for each of the determined work items,

determining a value to the work item of servicing by the resource, the value to the work item

being a measure of how the work item is treated compared to the other work items and treatment

goals of the individual work item; and selecting a determined work item that has a best combined

value of the business value and the value to the work item, to serve the resource. However,

Bushey et al. discloses creating a weighted attribute model for each customer (see column 3,

lines 14-67). Bushey et al. also discloses comparing the customer model with the agent model to

determine the highest match score (see column 4, lines 7-9). If the customer cannot have the

highest score matched agent, after a predetermined period of time the second best matching

agent answers the call (see column 4, lines 20-29). Therefore, it would have been obvious to one

of ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to

determine a customer, or work item, treatment value comprising a sum across all work item

treatments and select a determined work item that has a best combined score to be served by the

agent, or resource, as this allows the most skilled resource, or

agent, to be matched with the most compatible customer or work item thus improving

both customer and employee satisfaction.

As per claim 49, Walker et al. disclose all the limitations of claim 48 wherein

determining a business value comprises:

determining the business value weighted by a business value weight corresponding to the

work item (see column 7, lines 18-24, a weight is considered when determining the value for the

work item).

Walker et al. does not explicitly disclose determining a value to the work item comprises

determining the value to the work item weighted by a work item value weight corresponding to

the work item and selecting comprises selecting a determined work item that has a best

combined value of the weighted business value and the weighted value to the work item. Bushey

et al. discloses creating a weighted model using attributes for the customer (see column 3, lines

24-65). Bushey et al. also discloses comparing the customer model with agents' models to

determine the highest match score (see column 4, lines 4-9). Therefore, it would have been

obvious to one of ordinary skill in the art at the time of the invention to create a value to the

work item weighted by a work item value weight corresponding to the work item as this would

allow the work item to ensure that their most important attributes are matched first. By creating a

value that comprises selecting a determined work item that has a best combined value of the

weighted business value and the weighted value to the work item, the company many increase

customer and agent satisfaction by optimal pairing and therefore increase profit for the company.

As per claim 50, Walker et al. disclose all the limitations of the method of claim 49

wherein: determining a business value comprises determining a weighted business value as a

product of

(a) the business value weight corresponding to the work item (see column 7, lines 11-24, the weight corresponds to the work item); and

(b) a sum of products of a level of each said needed skill of the resource and a weight of said needed skill of the work item (see column 7, lines 11-24, a cost will be weighted for a work item in which the resource needs a particular skill).

Walker et al. does disclose creating a weight corresponding to a work item (see column 7, lines 11-24). Walker does not explicitly teach determining a value to the work item comprises determining a weighted work item treatment value as a product of (c) a work item treatment weight corresponding to the work item and (d) a sum of products of each treatment of the work item and a weight of the treatment of the work item. However, Bushey et al. discloses using all the customer attributes and information to create a weighted model (see column 3, lines 14-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to include creating weighted value for the work item as a product of the weighted work item and a sum of products of each treatment of the work item and a weight of the treatment of the work item, as taught by Bushey et al., as this would allow the work items to have the best matched agent or resource. By creating weighted work item treatment value, the company many increase productivity and profit for the company.

As per claim 51, Walker et al. disclose all the limitations of claim 50. Walker does disclose scaling business values (see column 7, lines 11-24, the weights are used to scale values). Walker does not explicitly disclose the sum of the products being scaled. However, Bushey et al. discloses creating a model using weights (see column 3, lines 56-65). These models can also be

scaled. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the

invention to scale the sum of the products as by incorporating both values in a scaled sum, both

the customers' and the agents' preferences are optimized.

As per claims 52, Walker et al. disclose all the limitation of claim 51 wherein:

selecting comprises selecting the determined work item that has a highest weighted business

value (see column 2, lines 8-12, a combination of weighted business values is taught. Walker

et al. uses the lowest sum combination rather than the largest sum to find the best

combination).

Walker et al. does not explicitly disclose selecting the determined work item that has a

highest sum of the weighted business value and the weighted work item treatment value. Bushey

et al. explicitly discloses matching the customer model and agent model with the highest

matching score. Therefore, it would have been obvious to one of ordinary skill in the art at the

time of the invention to modify the disclosure by Walker et al. to score the work items and

resources, as taught by Bushey et al., as it allows them to be matched based on an optimal

pairing of work items and employees.

As per claim 53, Walker et al. disclose all the limitations of claim 50 wherein: the work

item treatments of a work item comprise a time that work item has been waiting for service (see

column 17, lines 36-41,the work item is waiting for service). Walker et al. do not explicitly

disclose an estimated time that the work item will have to wait for service. However, Bushey et

al. discloses a maximum wait time for the agent (see column 4, lines 26-29). Furthermore, it is

old and well known in the art to provide an estimate as to how long a work item will need to

wait to be serviced. Therefore, it would have been obvious to one of ordinary skill in the art at

the time of the invention to modify the disclosure by Walker et al. to include providing an estimate on the time a work item will have to wait as it allows one to plan around when the resource will service the work item.

As per claim 54, Walker et al. disclose all the limitations of the method of claim 53, wherein the treatments of the work item further comprise a time by which the work item has exceeded its target wait time (see column 2, lines 8-12, the resource and the work item with the smallest cost combination are matched, by keeping a small cost combination, the resource can earn a higher profit from the work item).

As per claim 55, Walker et al. disclose all the limitations of claim 53, wherein the time that the resource completes the work item is predicted and displayed on the matrix. When the resource states that the work item is completed on time, early or late, the matrix changes and the values are recalculated to create low cost matches of the highest priority work items (see figure 16, and column 7). Walker et al. does not explicitly disclose an estimated weight time that the work item will have to wait for service comprises a product of (a) a ratio of a total number of work items waiting for service and an average number of work items waiting for service and (b) a sum of average wait times of individual said needed skills each weighted by a ratio of the weight of said individual skill and a sum of the weights of the needed skills. However, Bushey et al. discloses creating a maximum wait time for its work items (see column 4, lines 26-29). Furthermore, it is old and well known to estimate the wait time by using a ratio of the total work items and a sum of the average weight times. Therefore, it would have been obvious to one of ordinary skill in the art to modify the disclosure by Walker et al. to include providing an estimate

on the time a work item will have to wait as it allows one to plan around when the resource will

service the work item.

As per claim 56, Walker et al. discloses a computer readable medium containing

instructions which, when executed in a computer, cause the computer to perform selection of a

resource for a work item, comprising:

determining available work items that need skills possessed by the resource (see column

1, lines 63-67, and column 4, lines 8-12, the work item, or job, may require a resource, or

technician, to have a particular skill);

for each of the determined work items, determining a business value comprising a sum

across all skills of a product of a skill level of the resource in the skill and a skill weight of the

work item for the skill (see column 1, lines 65-67, through column 2, lines 1-12, and column 3,

lines 1-16, the business value is determined by finding the amount of time it would take the

resource, or technician, to complete the work item, or job). Walker et al. does not explicitly

disclose for each of the determined work items, determining a work item treatment value, the

work item treatment value being a measure of how the resource is spending time compared with

other work items and treatment goals of the individual work item, the work item treatment value

comprising a sum across all work item treatments of a product of a value of the work item for the

work item treatment and a weight of the work item for the work item treatment; and selecting a

determined work item that has a best combined score of its business value and its work item

treatment value, to be served by the resource. However, Bushey et al. discloses creating a

weighted attribute model for each customer (see column 3, lines 14-67). Bushey et al. also

discloses comparing the customer model with the agent model to determine the highest match

score (see column 4, lines 7-9). If the customer cannot have the highest score matched agent,

after a predetermined period of time the second best matching agent answers the call 9see

column 4, lines 20-29). Therefore, it would have been obvious to one of ordinary skill in the art

at the time of the invention to modify the disclosure by Walker et al. to incorporate determining a

customer, or work item, treatment value comprising a sum across all work item treatments and

select a determined work item that has a best combined score to be served by the agent, or

resource in the same conventional manner as disclosed by Bushey et al. because this would allow

the most skilled resource, or agent, to be matched with the most compatible customer or work

item thus improving both customer and employee satisfaction.

As per claim 57, Walker et al. disclose all the limitations of claim 56, wherein the work

item treatments of a work item comprise a time that the work item has spent time waiting to be

serviced (see column 17, lines 36-41,the work item is waiting for service). Walker et al. does not

explicitly disclose an estimated time that the item will spend waiting to be serviced, and a time

by which the work item has exceeded its target waiting time. Bushey et al. discloses creating a

maximum wait time for the customers or work items (see column 4, lines 26-29). However, it is

old and well known in the art to provide an estimate as to how long a work item will need to wait

to be serviced and have a target waiting time. Therefore, it would have been obvious to one of

ordinary skill in the art at the time of the invention to modify the disclosure by Walker et al. to

include providing an estimate and target waiting time for a work item as it allows one to plan

around when the resource will service the work item.

As per claim 58, Walker et al. discloses all the limitations of claim 56 wherein:

determining a business value comprises determining a scaled business value comprising the business value scaled by a first scaling factor that is common to all of the determined work items (see figure 12, and column 7, lines 11-24, the weights for probabilities are applied to time involved in carrying out a work item);

Walker et al. does disclose scaling values using probabilities (see column 6, lines 64-67 through column 7, lines 1-24) and creating priorities of work items. However, Walker et al. does not disclose selecting a determined work item that has a best sum of its scaled business value and scaled work item treatment value, to be served by the resource. Bushey et al. discloses creating a customer model using information and attributes and weights (see column 3, lines 14-65). Bushey et al.'s model can be scaled. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify the disclosure by Walker et a. to create a best sum of its scaled business value and scaled resource treatment value as it optimizes both the customer's or work item's and the agent's or resource's preferences.

As per claim 59, Walker et al. disclose all the limitations of claim 58 wherein: each scaling factor comprises a fraction having in its denominator a maximum value of the value to which said scaling factor applies of any of the work item (see column 7, lines 11-24, the scaling factor is a probability, therefore, its value can only be a number between zero and one).

Response to Amendments

6.   Applicant's arguments filed August 8, 2003 have been fully considered, but the same are not persuasive.

a). Applicant argues that independent claims 1, 9, 28, 29, 32, 33, 36, and 44 relate in part to determining a value to the resource of servicing the work items, or determining a resource treatment value, wherein the value to the resource or the resource treatment value is recited as "a measure of how the resource is spending time compared with other resources and goals of the individual resource." The Examiner acknowledges that Walker et al. lack this teaching, but asserts that Bushey et al. "teaches incorporating the goals of a resource by weighting attributes to create an agent model (see column 4, lines 1-3)" and that "Bushey et al. discloses measuring how a resource is spending time compared with other resources and that resource's goals by creating an agent model (by weighting attributes) and comparing the customer's model with the agents' model (see column 4, lines 1-33).

Applicant argues that the Examiner's assertion is incorrect. Column 4, lines 1-3, merely state that "the weighting value for each attribute is used in calculating and constructing of an agent model." Neither the weighting values nor the attributes are disclosed as relating to the goals of a resource. The weighting value is merely described as being "based on a relative importance of each attribute," column 3, lines 58-59. The agent model is described as being constructed by "using the sales strategies attributes values, customer service behaviors attributes values, and sales performance attributes values," column 3, lines 52-55. It should therefore be evident that, contrary to the Examiner's assertion, the passage of Bushey et al. referenced by the Examiner does not disclose incorporating the goals of a resource.

However Bushey does teach incorporation of goals in that "the invention includes calculating and constructing the agent model using sales strategies" (column 3, lines 60 – 62),

where strategies are the definitions of the goals and the means by which the goals are

achieved.

b). Applicant argues that column 4, lines 1-33, further state that performance-

optimizing calculations are used to generate match scores for agents, that the best match agent

is the agent with the highest match score, that a list of optimal agents is generated based on

agent match scores that are above an optimal threshold, that the customer request is routed to

an available agent on the list of optimal agents, that the customer request is placed in a wait

queue until an agent on the list of optimal agents becomes available, that additional agents are

added to the list of optimal agents the longer the request from this customer remains in the wait

queue, that the additional agent are added after reducing the optimal threshold, that wait time

increases while the customer request is in the wait queue, that the customer request is routed to

an available agent with the highest match score when the wait time equals a maximum wait

time, and that the optimal threshold and the maximum wait time are set by a call center

controller. The descriptions of the weighting value and the agent model (column 3, lines 52-55

and 58-59), which go into the computation of the match score, were already referenced above.

The customer model, which also goes into the computation of the match score, is described as

being constructed from the customer's historical information, information regarding the

customer's current task objective, and the customer's current expectations for satisfaction such

as his willingness to be up-sold, his preference for lengthy or brief negotiations, and his desire

to have questions answered, column 3, lines 14-41. None of this material includes even a

suggestion of measuring how a resource is spending time compared with other resources. It

should therefore be evident that, contrary to the Examiner's assertion, the passage of Bushey et

al. referenced by the Examiner does not disclose measuring how a resource is spending its time

compared with other resources and that resource's goals by creating an agent model and

comparing the customer's model with the agent's model. Since the art applied by the Examiner

fails to disclose, teach, or suggest the explicit recitations of applicant's independent claims 1, 28,

29, 32, 33, 36, and 44, the rejection of these claims and all claims dependent therefrom is not

well founded.

However Bushey does teach incorporation of goals in that "the invention includes

calculating and constructing the agent model using sales strategies" (column 3, lines 60 – 62),

where strategies are the definitions of the goals and the means by which the goals are

achieved. Additionally, Bushey does teach how an agent spends their time in that "agent

availability information from at least two agents" (column 4, lines 55 - 56), teaches that if an

agent is not available, then they are spending their time working and if said agent is available,

then they are spending their time not working and are in fact waiting to be employed.

c). Applicant argues that independent claims 13, 21, 30, 31, 34, 35, 48, and 56 relate in

part to determining a value to the work item of being serviced by the resource, or determining a

work item treatment value, wherein the value to the work item or work item treatment value is

recited as "a measure of how the work item is treated compared to other work items and

treatment goals of the individual work item." The Examiner acknowledges that Walker et al.

lack this teaching. But the Examiner asserts that: "Bushey et al. teaches creating a model of the

customer based on their preferences, skills and other attributes (see column 3, lines 14-67).

Bushey et al. also teaches selecting a determined work item, or customer, that has a best

combined value of the business value and the value to the work item to be served by the resource as the highest match score between the agent and the resource is selected (see column 4, lines 1-33)." The Examiner further asserts that: "Bushey et al. discloses creating a weighted attribute for each customer (see column 3, lines 14-67). Bushey et al. also discloses comparing the customer model with the agent model to determine the highest match score (see column 4, lines 7-9). If the customer cannot have the highest score matched agent, after a predetermined period of time the second best matching agent answers the call (see column 4, lines 20-29)."

Applicant argues that the disclosures of the passages referenced by the Examiner have already been discussed above. Even if the Examiner is correct in her just cited characterization of these disclosures, even the Examiner herself does not go so far as to actually assert that they disclose "a measure of how the work item is treated compared to other work items and treatment goals of the individual work item." And, indeed, there is no such disclosure. In particular, the passages of Bushey et al. referenced by the Examiner contain not one iota of a suggestion of a measure of how the work item is treated compared to other work items, as the preceding discussion of the disclosure of these passages amply shows. And since "a measure of how the work item is treated compared to other work items and treatment goals of the individual work item" is an explicitly recited requirement of each of the independent claims 13, 21, 30, 31, 34, 35, 48, and 56, the references do not and cannot render unpatentable these claims and all claims that depend therefrom. The Examiner's assertions of correspondence between the recitations of many other claims and the teaching of Walker et al. and Bushey et al. are likewise not well founded, as is shown below.

However Bushey does in fact teach how a work item is treated with respect to other

work items in that "performance optimizing calculations are used to generate a match score"

(column 4, lines 4 - 6), which is how said matching occurs. Matches are determined by the

result of a performance optimization calculation, which is a calculation that does in fact relate

work items to each other. Additionally, Bushey does teach incorporation of goals in that "the

invention includes calculating and constructing the agent model using sales strategies"

(column 3, lines 60 – 62), where strategies are the definitions of the goals and the means by

which the goals are achieved.

d). Applicant argues that claim 14 recites using a business value weight and a work item

value weight, both corresponding to the work item, to weigh the business value and the value to

the work item. The Examiner asserted that Walker et al. disclose weighted values at col. 7, lines

35-59. The Examiner is mistaken. The referenced passage of Walker et al. does not disclose,

teach, or suggest any weighting at all. But even if Walker et al. do suggest the use of weighted

values in general, and acknowledging that Bushey et al. do disclose the use of weighted values, it

is still not seen how Walker et al., and Bushey et al. can be interpreted to suggest weighting the

business value and the value to the work item each by its own weight and both of which weights

correspond to the work item, as required by claim 14. Unless such specific disclosure, teaching,

or suggestion can be found in the references, they cannot be said to render claim 14 unpatentable.

However, Walker does teach weighting in teaching a combination in "the combination

of technicians and jobs for which the total of the technician/job cost value is a minimum"

(column 7, lines 32 - 34). The waiting is the usage of the attributes that determine the

technician/job cost value. Additionally, Bushey does teach incorporation of goals in that "the invention includes calculating and constructing the agent model using sales strategies" (column 3, lines 60 – 62), where strategies are the definitions of the goals and the means by which the goals are achieved.

e). Applicant argues that claim 15 further defines a weighted business value as "a product of (a) the business value weight corresponding to the work item, and (b) a sum of products of a level of each of said needed skill of the resource and a weight of said needed skill of the work item." The Examiner asserted that such teaching may be found in Walker et al. at col. 7, lines 11-24. This passage merely states that factors such as the ability of the technician to perform the job and the amount of non-productive technician time can be taken into account and weighted for probability. It is not seen how this disclosure teaches or suggests either the particular parameters, or the particular computation using those parameters, that are recited in claim 15. For example, applicant respectfully asserts that Walker et al. do not disclosure, teach, or suggest either skill levels or skill weights, or the weighting of the sum of the products thereof. If the Examiner continues to believe otherwise, she is requested to point out <u>with particularity</u> the correspondence between the claim's exact parameters and computations and the disclosure of Walker et al.

However, Walker does teach "skill type distribution" (column 15, lines 8 - 9), wherein by definition of the statistical concept of a distribution, a plurality of factors or levels must in fact exist for a distribution to be calculated. Additionally, Bushey does teach incorporation of goals in that "the invention includes calculating and constructing the agent model using sales

strategies" (column 3, lines 60 – 62), where strategies are the definitions of the goals and the means by which the goals are achieved.

f). Applicant argues that claim 15 further defines a weighted work item treatment value as "a product of (c) a work item treatment weight corresponding to the work item and (d) a sum of products of each treatment of the work item and a weight of said treatment of the work item." The Examiner asserted that such teaching of the use of attributes and weights in creating a customer model may be found in Bushey et al. at column 2, lines 56-59. This passage merely states that the behavioral model of agents is calculated from a detailed profile of their sales strategies, customer service behaviors, and sales performance. It is not seen how this disclosure teaches or suggests either the particular parameters, or the particular computation of those parameters, recited in claim 15. If the Examiner continues to believe otherwise, she is requested to point out with particularity where the exact teaching of the claim recitations may be found in Bushey et al.

However a projected total cost and the value of the cost function for a job as taught by Bushey are in fact a sum of all the costs associated with a job. Additionally, Bushey does teach incorporation of goals in that "the invention includes calculating and constructing the agent model using sales strategies" (column 3, lines 60 – 62), where strategies are the definitions of the goals and the means by which the goals are achieved.

g). Applicant argues that claim 16 further recites that the sums of products recited in claim 15 are scaled sums and that the treatments are scaled treatments. The Examiner pointed out

that Bushey et al. disclose weighting customer's attributes to create models and using the model

scores to create a best match. She then asserted that "Bushey et al. can also scale the scores"

Whether or not Bushey et al. can do something is irrelevant; the question is whether they teach,

disclose, or suggest doing so. And in this case, they do not. Applicant fails to find any such

teaching in Bushey et al. Applicant therefore requests the Examiner to point out with

particularity where "scaling sums" is disclosed in Bushey et al. and where application of this

concept to sums of products of skill levels and skill weights and to work-item treatments is

suggested anywhere by Bushey et al.

However, a projected total cost and the value of the cost function for a job as taught by

Bushey are in fact a sum of all of the costs associated with a job. Additionally, Bushey does

teach incorporation of goals in that "the invention includes calculating and constructing the

agent model using sales strategies" (column 3, lines 60 – 62), where strategies are the

definitions of the goals and the means by which the goals are achieved.

h). Applicant argues that claim 17 recites that selecting a work item in claim 16

comprises selecting the work item that has a highest sum of the weighted business value and the

weighted work item treatment value. Since it has been shown above that Walker et al. and

Bushey et al. do not disclose the computation of the weighted business value and the weighted

work item treatment value as defined by the base claims, it is not seen how these references can

be deemed to disclose a selection based on the sum of these non-existent values.

However, Walker does teach weighting "the combination of the technicians and jobs

for which the total of the technician/job cost values is a minimum" (column 7, lines 32 - 34),

where the job costs are part of a weighting that determines a minimum value. Additionally,

Bushey does teach incorporation of goals in that "the invention includes calculating and

constructing the agent model using sales strategies" (column 3, lines 60 – 62), where

strategies are the definitions of the goals and the means by which the goals are achieved.

i). Applicant argues that claim 20 defines a particular formula for the estimated wait time

that a work item will have to wait for service. The wait time is defined as "a product of (a) a ratio

of a total number of work items waiting for service and an average number of work items

waiting for service, and (b) a sum of average wait times of individual said needed skills each

weighted by a ratio of the weight of said individual skill and a sum of the weights of the needed

skills." The Examiner purported to find a corresponding teaching in Walker et al. at Fig. 16, col.

6, lines 53-63, and col. 7, lines 1124 and 35-59. This figure and passages describe a time-

dependent cost function for each job that takes into account the penalty for failing to meet an

agreed time, the ability of the technician to perform the job, a weighting of the costs for

probability, and the selection of a lowest-cost function from among possible technician-and-job

combinations. But it fails to disclose (1) a ratio of total and average numbers of waiting jobs, (2)

average wait times of individual needed skills, (3) weights of individual skills, (4) a sum of (3)s,

(5) ratios of (3)s and (4), use of (5) as weights for (2), (6) a sum of (5)s, and (7) a product of (1)

and (6). Walker et al. thus cannot be said to disclose, teach, or suggest claim 20. Nor is any such

teaching to be found in Bushey et al.

However, Bushey does teach the number of work items waiting for service "the request from the customer is placed in a wait queue" (column 4, line 18). Since the "customer is placed in a wait queue until the agent on a list of agents becomes available" (column 4, lines 18 – 19), the wait times of the individual customers is also known. With access to said data, counting the number of people in a wait queue and calculating the average wait time of a plurality of customers wait times is a trivial calculation and would be simple and very obvious to perform. Additionally, Bushey does teach incorporation of goals in that "the invention includes calculating and constructing the agent model using sales strategies" (column 3, lines 60 – 62), where strategies are the definitions of the goals and the means by which the goals are achieved.

j). Applicant argues that claims 21 and 30 recite that, for each available work item that needs skills possessed by a resource, the business value is determined as "a sum across all skills of a product of a skill level of the resource in the skill and skill weight of the work item for the skill." The Examiner purported to find a corresponding disclosure in Walker et al. at col. 7, lines 11-24. The Examiner is mistaken. As was pointed out previously, this passage merely states that factors such as the ability of the technician to perform the job and the amount of non-productive technician time can be taken into account and weighted for probability. Walker et al. in general, and this passage in particular, fail to disclose, teach, or suggest resource skill levels for skills, skill weights of the work items for skills, the products thereof, and the sums of these products. The Examiner's assertion that "every resource [of Walker et al.] contains a skill level and is weighted according to this skill level when combined with a work item" is wholly unfounded.

However, Bushy does teach that a "request from a customer is placed in a wait queue until the agent on the list of optimal agents becomes available" (column 4, lines 18 – 19), wherein the optimality of the agents being selected is determined based upon "customer service behavior attribute" (column 3, lines 61 – 62). Skills are further taught by Walker as "the different skills required to do all of the jobs, or the time needed to complete them" (column 14, lines 53 - 54). Additionally, Bushey does teach incorporation of goals in that "the invention includes calculating and constructing the agent model using sales strategies" (column 3, lines 60 – 62), where strategies are the definitions of the goals and the means by which the goals are achieved.

k). Applicant argues that claim 21 further recites that, for each available work item that needs skills possessed by a resource, the work item treatment value is determined as "a sum across all work item treatments of a product of the value of the work item for the work item treatment and a weight of the work item for the work item treatment." The Examiner purported to find teaching thereof to flow from the disclosure of Bushey et al. of creating a weighted attribute model for each customer, comparing the customer model with the agent model to determine the highest match score, and answering the call with the second best matching agent after a period of time if the customer cannot have the highest score matched agent. The Examiner's view is unfounded. Claim 21 defines a particular formula for computing work item treatment values, which particular formula is not disclosed by Bushey et al.

However, Bushey does teach the number of work items waiting for service "the request from the customer is placed in a wait queue" (column 4, line 18). Since the "customer is placed in a wait queue until the agent on a list of agents becomes available" (column 4, lines 18 - 19), the wait times of the individual customer is known. Applicant does not teach a particular scientific calculation of formula per se, but rather teaches use of the vague terms "best combined score" without commenting what criteria are used to determine how best is derived at. Similarly, "best combined score" and "sum across all work" do not fit the form of a formula. Additionally, Bushey does teach incorporation of goals in that "the invention includes calculating and constructing the agent model using sales strategies" (column 3, lines 60 – 62), where strategies are the definitions of the goals and the means by which the goals are achieved.

l). Applicant argues that claim 22 recites particular work item treatments. Since the prior art fails to disclose the formula of claim 21 for computing work item treatment values, it cannot be said to disclose the use of particular work item treatments in this non-existent formula. However, best combined score" and "sum across all work" do not fit the form of a formula. Additionally, Bushey does teach incorporation of goals in that "the invention includes calculating and constructing the agent model using sales strategies" (column 3, lines 60 – 62), where strategies are the definitions of the goals and the means by which the goals are achieved.

m). Applicant argues that claim 23 recites three different scaling factors and the

application thereof to the computation of business value and work item treatment value. The

Examiner pointed out that Bushey et al. discloses creating a customer model using customer

attributes, weights, and other information, that the models could be scaled, and that the customer

model is compared to agent models to determine the highest match score, and concluded that this

teaching would have made it obvious to determine a scaled work item treatment value. Perhaps

so. But Walker et al. and Bushey et al. nevertheless fail to disclose a business value scaling

factor that is common to all determined work items, a work item value scaling factor that is

common for that work item treatment to all of the determined work items, and a value sum

scaling factor that is common to all of the determined work items across all work item

treatments. Hence, the references cannot be said to render the claim obvious.

However does teach the claimed sum of scaled business value in teaching a total cost.

Total cost encompasses all factors that go into evaluating the value of each individual

business and thereby using this value to compare all business values. Bushey also teaches a

"match score" (column 10, line 20) to compare agents with clients. A common element is the

"threshold match value" (column 10, line 38) which each customer does set individually and

therefore provides a common frame of reference against which all agents can be measured.

Additionally, Bushey does teach incorporation of goals in that "the invention includes

calculating and constructing the agent model using sales strategies" (column 3, lines 60 – 62),

where strategies are the definitions of the goals and the means by which the goals are

achieved.

In light of the above stated facts, examiner respectfully states that applicant's arguments

have been fully considered, deemed unpersuasive and the rejections under the prior Office

Action, mailed June 18, 2003 are maintained.

Conclusion

7.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR

1.136(a) will be calculated from the mailing date of the advisory action. In no event, however,

will the statutory period for reply expire later than SIX MONTHS from the date of final action.

8.   Any inquiry concerning this communication or earlier communications from the

Examiner should be directed to Eric Shaffer whose telephone number is (703) 305-5283. The

Examiner can normally be reached on Monday-Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Tariq Hafiz can be reached on (703) 305-9643. The fax number for the organization

is (703) 305-0040/308-6306

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the Receptionist whose telephone number is (703) 305-3900.

Eric Shaffer

October 16, 2003

TARIQ R. HAFIZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600